

BY-LAWS AND OFFICERS
OF THE
Chatham Cobalt Mining Company :
WITH
R E P O R T S
ON THEIR
COBALT AND NICKEL MINES,
IN
CHATHAM, MIDDLESEX CO. CONN.

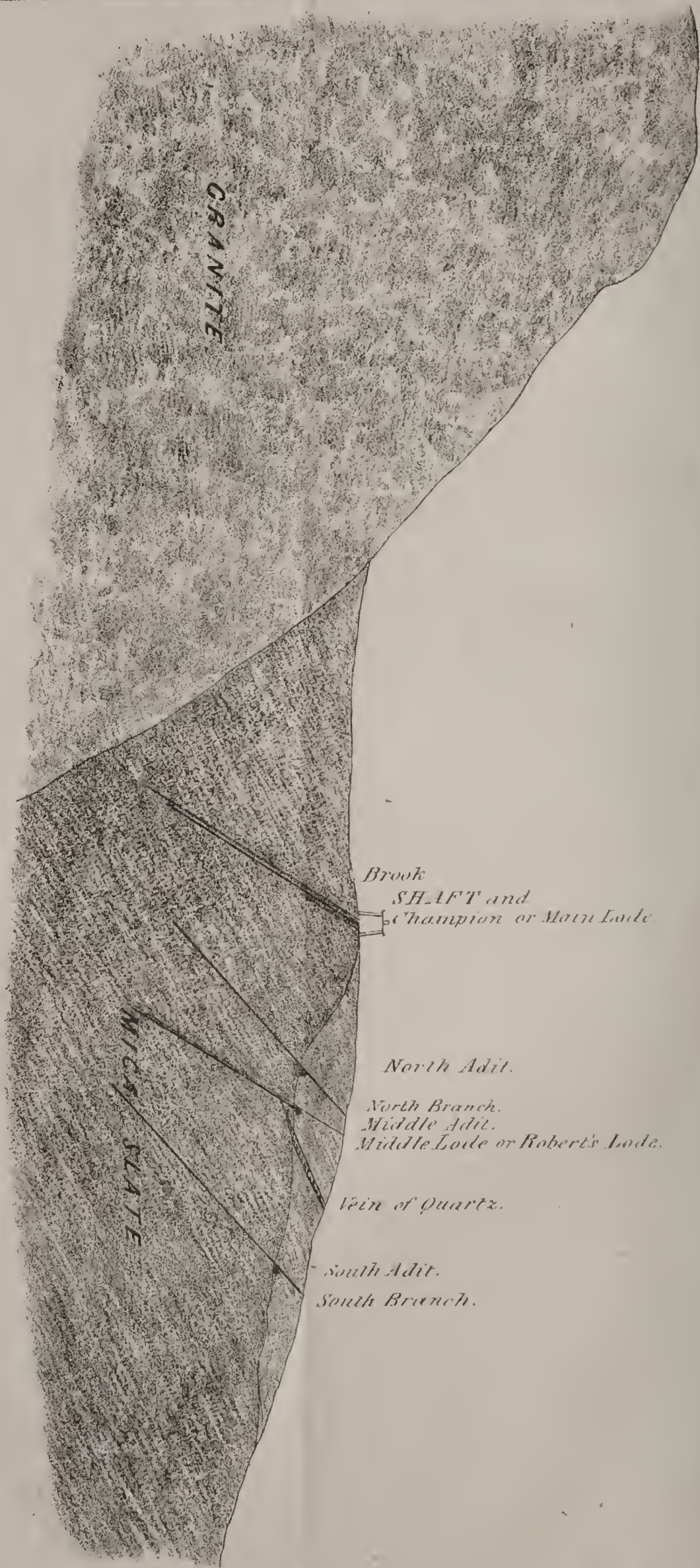
BY
C. F. A. SIMONIN,
OF THE FIRM OF
W. COFFIN & CO. COBALT AND NICKEL REFINERS
PHILADELPHIA:
AND
C. S. RICHARDSON,
MINING ENGINEER.

WITH ASSAYS OF THE ORE, &c. &c.

6-19204
ELIHU GEER, STATIONER AND STEAM PRINTER,
10 STATE ST. HARTFORD.

MDCCLIV.

COMPARATIVE SECTION ACROSS THE SETT.



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Chatham Cobalt Mining Company.

OFFICE, 58 BEAVER STREET, N. Y.

ORGANIZED UNDER THE GENERAL LAW OF THE STATE OF N. Y.

100,000 Shares. . . Par Value, Five Dollars each.

TRUSTEES:

W. COFFIN, *Philadelphia.*

CHARLES GOULD, *New York.*

E. A. RUSSELL, *Middletown, Conn.*

JOHN LAIDLAW, *New York.*

T. R. HUBBARD, *New York.*

PRESIDENT:

W. COFFIN.

SECRETARY:

W. L. HUBBARD.

TREASURER:

T. R. HUBBARD.

B Y - L A W S

OF THE

Chatham Cobalt Mining Co.

ARTICLE 1.—OFFICE OF BUSINESS.

THE principal office for the transaction of the business of the Company, and the general direction of its affairs, shall be located in the City of New York.

ARTICLE 2.—AGENT AT THE WORKS.

The Trustees shall appoint an Agent residing in Middlesex County, Connecticut, who shall have charge of the Company's business, and perform all duties required of such Agent by the Trustees.

ARTICLE 3.—MEETING OF STOCKHOLDERS.

An annual meeting of the Stockholders shall be held at the office of the Company, in the City of New York, on the second Wednesday in December, in each year, commencing on the second Wednesday of December, 1854. Twelve days previous notice of the same shall be given, by publication in at least one newspaper printed in the city of New York.

ARTICLE 4.—VOTES AND PROXIES.

At all elections and business meetings of the Stockholders, each share of stock shall be entitled to one vote, and may be voted by the holder in person, or, in his absence, by proxy.

ARTICLE 5.—ELECTION OF TRUSTEES.

A Board of Trustees shall be elected at each annual meeting of the Stockholders. In case of vacancy, by resignation or otherwise, the vacancy shall be supplied by the remaining Trustees. If no election shall take place at the annual meeting of Stockholders, the Secretary shall immediately thereafter call a meeting for the election of Trustees, by publishing a notice for that purpose, at least fourteen days previously, in one newspaper printed in the city of New York. If no election of Trustees shall take place at a meeting so called, the existing Trustees shall remain in office until the next annual meeting of Stockholders.

ARTICLE 6.—CHOICE OF PRESIDENT AND OTHER OFFICERS.

The Board of Trustees shall, immediately after their organization, proceed to choose a President, from their number; and they shall appoint a Secretary and Treasurer, and shall fix their compensation.

ARTICLE 7.—POWERS AND DUTIES OF TRUSTEES.

The Board of Trustees shall have the control and management of the affairs and property of the Company, subject to the purposes, limitations, and restrictions of the By-Laws, and to the instructions of the Company, by a vote, at any regular meeting, when a majority of the stock is represented.

They shall have power to appoint and employ such, and as many agents and servants as the interests and business of the Company may from time to time require; to fix their compensation and define their duties.

They shall render an account at every annual meeting of the stockholders, showing in detail the situation of the property and financial affairs of the Company: and they shall also render a similar account at any regular meeting of the stockholders, when required by a vote thereof to do so; and generally they shall have full

power to do all such acts, and to adopt all measures, not inconsistent with the laws of the State, or the By-Laws of the Company, (subject, however, to special instructions by a vote of the stockholders, as aforesaid,) as they shall deem best calculated to promote the interests of the stockholders.

ARTICLE 8.—SPECIAL MEETINGS OF THE COMPANY.

Special meetings of the Company may be called by the Board of Trustees, or by the Stockholders representing two-thirds of the stock of the Company; and at any such meeting, two-thirds of the stock in interest may do any act which is provided to be performed at an annual meeting.

ARTICLE 9.—MEETING OF TRUSTEES.

The regular meetings of the Board of Trustees shall be held at the office of the Company, on the first Wednesday of every month, in the City of New York, (special meetings shall be held at the same place, unless a majority of them shall appoint some other place of meeting, and may be called by any two of the Trustees upon proper notice by the Secretary.) At all meetings of the Board of Trustees, three members shall constitute a quorum for transacting the regular, appropriate and necessary business of the board.

ARTICLE 10.—DUTIES OF PRESIDENT.

It shall be the duty of the President to preside at all meetings, both of Stockholders and Board of Trustees; to sign all bonds, debentures or contracts entered into by, or in behalf of the Company, unless in cases otherwise ordered by the Board of Trustees; to sign all certificates of stock, and in general to perform all acts incident to such corporate office. In the absence of the President, the meeting may appoint a President pro tem. who shall, during his absence, discharge all the duties of President.

ARTICLE 11.—DUTIES OF SECRETARY.

The Secretary shall notify all special meetings of Stockholders and Board of Trustees, and shall record the proceedings of all their meetings, and keep proper books of account for the business of the Company—a stock ledger, transfer-book, and such other books and papers, as the Trustees may direct; all which, said books and correspondence shall be kept in the office of said Company, open at all reasonable times for the inspection of the Trustees or Stockholders. He shall countersign and register all certificates of stock, and other documents, requiring the signature of the President; and generally shall perform all such services and duties as usually pertain to his office in a corporate body. In the absence of the Secretary, the meeting may appoint a Secretary pro tem., who shall, during his absence, discharge all the duties of Secretary.

ARTICLE 12.—DUTIES OF TREASURER.

The Treasurer shall have the custody of all the funds of the Company, until the same shall be divided or appropriated by the Board of Trustees, and his bank account shall be kept in the name of the Company. He shall sign receipts and acknowledgments for all moneys and other property of the corporation, which may come into his hands, and disburse and appropriate the same, only under the direction, and with the sanction of the Board of Trustees. He shall render a full and particular statement of his cash account, at every annual meeting of the Company, with vouchers, showing the condition of the financial affairs, and a similar account at any regular meeting of the Stockholders, when required by a vote thereof, to do so; and shall exhibit his books and accounts, upon application of any Trustee.

ARTICLE 13.—CERTIFICATES OF STOCK.

The Certificates of Stock, shall be numbered and registered, as

they are issued; they shall exhibit the holder's name, and the number of shares, and shall be signed by the President, and countersigned by the Secretary. Transfer of stock shall only be made on the books of the Company, either by the holder in person, or by Attorney, and the possession of a Certificate of Stock shall not be regarded as vesting any ownership of the same in any other than the person in whose name it is issued, (as between the Company and such other holder,) until the transfer is duly made on the books of the Company, as aforesaid.

ARTICLE 14.—DIVIDENDS.

The Trustees shall declare dividends out of the nett profits of the Company, when, and as often as, in their opinion, the state of the Company's funds will permit—giving due notice, by publication or otherwise, of the time and place of payment of any such dividend; such payment to be made to those stockholders who shall appear, by the stock-ledger, to be entitled to the same, on the day such dividend was declared.

ARTICLE 15.—AMENDMENT OF BY-LAWS.

The foregoing By-Laws may be altered, amended or repealed at any annual meeting of the Stockholders, by a vote of three-fourths of the stock represented at such meeting, or at a meeting called specially for that purpose, previous notice of such special meeting having been published at least six days, in a paper printed in the City of New York.

Office of the Chatham Cobalt Mining Co.

58 BEAVER STREET, N. Y. }
December, 1853. }

The Executive Trustees of the Chatham Cobalt Mining Company, instead of presenting to the Stockholders, a number of Reports of Professors of Geology—a custom generally practiced by Mining Companies in this country, but never followed in the large mining districts of Europe—offer hereby the following statements, coming from men practically acquainted with the subject upon which they report, and being therefore the best judges.

It is hardly necessary to say that the firm of W. Coffin & Co., in which Mr. Simonin has been for many years, the partner who had charge of the refining works, is the only concern in America, in *successful* operations for working Cobalt and Nickel Ores. Their most valuable and extensive works, erected expressly for that purpose, are situated in Philadelphia. and they are now building still larger ones in Camden, N. J. The Oxyd of Cobalt, manufactured by them, is pronounced in England, superior to any produced there, while their metallic Nickel is eagerly bought in this country, by the manufacturers of German Silver.

The ores analyzed by Mr. Simonin, were, as he states in his report, *taken by him directly from the mine*, in various samples, and his assays of the same, with the general per centage of the lode, and the contract for the ore, &c. &c., will be found below.

It must be gratifying to the stockholders, that since the reports of Messrs. Coffin & Co., were received, Mr. W. Coffin has consented to become the President of the Company, a post to which his long experience of the Cobalt and Nickel trade, make him eminently qualified,

A report on the mine itself by C. S. Richardson, Esq., an eminent scientific and practical mining engineer from London, whose authority is highly esteemed throughout the great mining districts of England, is also presented along with a map of the Sett, as drawn by him.

It may be well to say a few words more as to the property of the Company. The lands on which their mining operations are being carried on are situated in the town of Chatham, Middlesex, Co., Connecticut.

They are in the neighborhood of Great Hill, a very romantic mountain, which is said to be the highest elevation in the County. These lands, comprising about one hundred and thirty acres, traversed by several lodes, are held under general mining leases, granted by different individuals. The most important of these leases are given in such a manner that the Company can hold the lands for as long a time as they may desire, the only condition for their ever continuing duration, being a punctual payment of the rents. These amount for the whole mining property to \$408 per annum, an amount very trifling, in consideration to the mineral value of the lands. A never ceasing stream runs through the property, yielding more than the necessary water for the process of dressing and washing the ore. The right of erecting dams on this stream, and of using the water power thereby gained, is also secured. As the public road is near the mine, there will be no difficulty in transporting the ore for shipment to Middle Haddam Landing, the distance of which from the mines is about two miles. Here numerous vessels and steamers bound to New York, and Philadelphia, stop daily. Plenty of timber of all kinds grows in the neighborhood of the mines, and can be obtained for a fair price. The Company have also obtained the refusal of excellent mineral, wood and building lands near the mine for a low price, which can be purchased whenever it is deemed necessary.

The mines of the Company *are the only ones in the United States, which yield Cobalt and Nickel Ore, in a regular vein not mixed with other metallic substances.* The great advantage derived thereby, is at once perceived, as the separation of the rock from the ore, can be effected by merely simple mechanical means, which, in the only other two mines in this country, yielding Cobalt and Nickel ores, in any quantity, cannot be done. These two mines are the Mine La Motte, in Missouri, where the Cobalt and Nickel ore is intimately blended with Copper pyrites, which makes the extraction of the ore most difficult, and the Mines of the Potapscow Copper Mining Company, where it occurs sparingly under similar circumstances.

The lode (Roberts' Lode) upon which the principal mining operations have been based so far, and from which the richest ore (that analyzed by Mr. Simonin) is obtained, is in no wise connected with the old Chatham Cobalt Mines, which, as they have no regularly dipping lode, but were worked without any system upon what miners call a flat lode, with very little ore, and that little, strongly mixed with Zincblende, Galena, &c. &c., proved heretofore a failure. Roberts' lode is a newly discovered regular vein, yielding, according to Mr. Simonin's assays, 2.2 p. c. of Cobalt and Nickel, *as it is raised out of the mine, along with rock, &c.* though the only level through which it has been worked so far, is but a few feet from the surface.

The commercial value of the ore is given in the letter of Mr. W. Coffin, to the present Treasurer of the Company. Cobalt* is the source from which the blue enamel on China and stone ware is obtained, and it finds many other applications in the arts. Nickel is the metal from which German Silver is manufactured.

* What is commonly in trade called Cobalt, is not Cobalt in reality, being nothing but an impure Arsenic Acid. *Cobalt is worth at present, fourteen shillings sterling per pound.*

REPORT OF C. F. A. SIMONIN, Esq.

Philadelphia, Nov. 18th, 1853.

T. R. HUBBARD, Esq.

SIR:—BY request of Doctor Francfort, I visited the Cobalt Mine of the “Chatham Cobalt Mining Company,” and took therefrom a sufficient number of specimens of ore to illustrate, as far as analysis concerns the character of the lode the Company is at present working, as also to throw as much light as possible on the prospects of your present operations.

These specimens were taken by me from the lode designated as “Roberts’ Lode,” and were four in number, viz:

A—a specimen of the general run of the lode, crushed and washed in my presence, by Captain Roberts.

B—a specimen of coarse grained washed ore.

C—a specimen of finer grained washed ore.

D—a specimen of the general run of the lode, (not washed.)

I regret that not having sufficient time allowed me, I have been compelled to confine myself to merely testing your ores *for Cobalt and Nickel*, which I hope will answer your present purposes. The results of my tests are as follows:

A—18.2, per cent of Oxide of Cobalt and Nickel.

B—13.85, “ “ “ “

C—13.7, “ “ “ “

D—2.2, “ “ “ “

The relative proportions of Oxide of Cobalt and Nickel in these different results, are

Oxide of Nickel,	.	.	.	50.6
Oxide of Cobalt,	.	.	.	49.4

These proportions may however change very much in the different levels of your lode, in fact I have tested at a former time a specimen of ore sent to our firm by Mr. W. L. Hubbard, which gave me nearly twenty-five per cent of oxide of Cobalt and Nickel, containing the Nickel in much smaller proportions. This large amount of Nickel may seem to lessen the intrinsic value of your ores; this however is but seemingly the case, taking into consideration the large quantity of ore which you are enabled to bring into the market, and the but limited consumption of Cobalt, whilst the applicability of Nickel to many different purposes in the arts will enlarge its consumption and consequently retain its value.

In alluding to the prospects of your Mining operations, I can but express myself most favorably; although a yield of 2.2 per cent. may appear but very inconsiderable, it is nevertheless abundantly sufficient to pay for its extraction. In making this assertion I take into consideration the great advantages and facilities your mine offers. You have a large, fully defined lode with the ore well disseminated, very easy and consequently cheap mining, the great advantage of concentrating your ores by merely mechanical means to a high per centage, the prospects of an almost unlimited supply of ore, and from the fact that your mining operations so far being but surface operations, we may infer from analogy that your lode will increase in richness and size as you extend your operations to a greater depth.

In reference to the price our firm may consider itself justified in offering your company, I would refer you to Mr. William Coffin, who has the commercial affairs of our firm under his particular care, and intends to address you on the subject.

Wishing you every success, I remain dear sir,

Yours very respectfully,

C. F. A. SIMONIN.

“LETTER OF W. COFFIN, Esq.”

T. R. HUBBARD, Esq.

Dear Sir,—

By request of Dr. Francfort, we make you an offer for the Cobalt and Nickel ore to be obtained from your Chatham mine in Connecticut. We base our offer on the ore being washed up to eighteen per cent. of Cobalt and Nickel as per sample *taken from the mine* and washed and tested by our Mr. C. F. A. Simonin. *This contained about nine per cent. of Cobalt and nine per cent. of Nickel.* Thus allowing two per cent. of Oxide of Nickel to be equal in value to one per cent. of Oxide of Cobalt, the Nickel would be equal in value to about four and a half per cent. of Oxide of Cobalt, which will make the ore equal to thirteen and a half per cent. Oxide of Cobalt in value.

For the above we will give you *two hundred dollars per ton* of 2240 pounds, delivered at the wharf in Philadelphia, on twelve months' credit from delivery; or a deduction of ten per cent. for cash. In case you require our notes or a settlement at a shorter time than twelve months, we are to be allowed a discount at the rate of ten per cent. per annum for the time until the account becomes due.

We will take two hundred tons of the ore for the first year, (commencing from the time of the first delivery of the same,) at the price named, and after that time will refine all that we can sell. Cobalt is worth fourteen shillings sterling per pound, at the present time; and we would wish to add this condition after the first year, or from the commencement if you prefer it, viz: that in case the price of cobalt or nickel should vary from fourteen shillings sterling per pound for cobalt, and one dollar and seventy

cents per pound for nickel, that you should bear half the loss in case the price falls, and that we should allow you one-half the extra profits in case the price advances above the price named, in addition to the one of 200 dollars per ton as before mentioned.

Yours respectfully,

WILLIAM COFFIN & CO.

P. S. It is understood that the above offer is made on condition that we are to have twenty-five hundred shares of the stock of the Chatham Cobalt Mining Company, at the regular subscription price, and the refusal of twenty-five hundred shares additional, at the same price at a future time.

Yours, &c.

WILLIAM COFFIN & CO.

REPORT OF C. S. RICHARDSON, Esq.

T. R. HUBBARD, Esq.,

Treasurer Chatham Cobalt Mining Co.

SIR :—Your valuable mineral property is situated about six miles from Middletown, Conn. The sett is one of considerable extent and amply sufficient to make a large mine. It is in a locality highly congenial for minerals, and more particularly for copper, being immediately on the junction of the Granite and Slate formation. The strata appear to be regular, although some what flat; this, I am certain, will change in depth, as it is found to do in most sloping grounds near the primary mountain slopes. It is in situations like this that the Cornish miner looks for good mines; a reference to the maps of Cornwall will show that most of our rich copper mines, particularly in the neighborhood of Camborne and Redruth are similarly located.

THE MAIN LODE OR CHAMPION LODE.

This is a truly beautiful lode; and is the champion lode of which all the others yet discovered are the feeders, which in depth will fall into it. Its underlay is towards the granite, which is very favorable, about four feet to the fathom or at an angle of 50° with the horizon, but which will get more vertical in depth. It is nearly five feet wide, carrying a leading vein of quartz with arsenical ore going down. On this lode a shaft has been sunk eight fathoms deep, as I understand; the water being in it, I could not examine the bottom, but Captain Roberts, the agent of the mine, informed me that there is a good course of ore now opened, and the specimens shown me confirm the truth of his statement. I examined

the deads from the shaft, and find that ore is finely disseminated through the lode. I am certain a lode like this cannot fail to make a large quantity of ore when it is intersected by the droppers and other parallel small veins. The ore is at present an arsenical Iron with its usually associated minerals, Mundic, Nickel and Cobalt. I should advise the erection of a small steam engine to prove the Lode down 20 or 30 fathoms. This can be done at a small expense. The engine need not to be placed at the shaft, but may be erected on the site chosen for the stamps and dressing floors. The pumps should be actuated by means of flat rods, as the distance will not be very great. When the lode has been driven on some 20 fathoms each way, the proper place for the working Engine shafts may be determined. Then a perpendicular shaft should be put and a proper pumping engine erected. The bearing of the lodes varies but little with each other. They appear to run with the Granite range, which is nearly N. E. and S. W. Shode pits have been put down in many places on the backs and have proved them to have a regular bearing, besides carrying strings of ore up to the very surface.

There are three other lodes on the property, which I will describe as,

No. I.—A south lode,

No. II.—*The middle or Roberts lode.*

No. III.—The North Branch.

No. 1. *The South lode, called by you Barratt vein*; this lode or branch is a flat underlayer, its underlay being seven feet in the fathom, bearing 72° N. E. A level has been driven on it for a few fathoms. It will continue its inclination until it falls in with the lode No. 2. It has a greater dip than the strata, which are Mica Slate of a very shaly decomposed character, quite congenial for making ore. At the present shallow depth it is about sixteen

inches thick, and composed out of a Mica Flucan with traces of cobalt ore ; between this and Roberts lode is a dropper or vein of opaque quartz, eight inches thick, dipping also towards No. 2. This will in my opinion, if it holds down strongly influence the No. 2 lode, and probably heave it away faster towards the Champion Lode, but there is no positive reliance to be placed in it, as strings of quartz of this character are frequently found in the Slate formation in the form of floors or beds and thus die out.

No. 2. *Middle or Roberts Lode.*

(*This is the Lode upon which the Company carry on at present their chief operations.*)

This is a very pretty lode situated twenty-one fathoms North of No. 1. It averages two feet in thickness, dips five feet to the fathom. Its bearing is 70° N. E. Its veinstone is gneiss with a great deal of black mica and red garnet, its ore the true Nickel and Cobalt ore. A level is being driven on its course easterly, which is now extended to $31\frac{1}{2}$ fathoms. In the back of this level some ground is now being sloped away, which is good stamp work. The lode is spotted with ore throughout, in fact the whole is saving work, and if it was in the old country would set at a fair tribute. I am somewhat surprised tribute pitches are not set in a lode like this, particularly as the ground is so fair. The specimens taken, as hereinafter described, were a fair sample of the end, back and bottom of the lode. The results of the yield of saleable ore gained from them, are sufficiently satisfactory for any reasonable person to expect from a lode not six fathoms from grass. In fact, I was greatly astonished when I made a van of its contents.

No. 3, or North Branch.

This lode is seven fathoms distant from No. 2, and is a flat underlayer, being seven feet to the fathom. It is entirely composed of Mica Flucan. The country around it, is in a very decom-

posed state. The lode appears to be one foot thick, but in consequence of its unsettled state, very little can be said of its properties. A level has been driven on it five and a half fathoms. There appears very little alteration of its properties in the end. I did not perceive any mineral in it. If this branch does not materially alter in depth, it is very likely to form a slide. Large deposits of mineral take place, and the lodes are enriched by slides, but till they are troublesome. There not being any plan of the sett, I have been unable to lay out the exact position of the lodes on paper, but the following section will give an approximate idea of their relative positions. I should advise you to have the property properly surveyed and a working plan made of the intended works. By doing this, you will see what is required, and then an estimate can be made of the cost of erecting machinery, &c., &c.

As you are already satisfied that the lodes are productive, you should this winter prepare for the erection of a high-pressure engine of about 14 inch cylinder, which working at 40 pound steam will give you 20 horse power. It should have a long stroke, and made to work expansively to save fuel. To this engine, on the North side, will be connected the flat rods of the trial shafts, in which must be dropped a lift of 8 " Pumps and balance bob for a five feet stroke; this going 12 strokes per minute, will draw 120 gallons of water, which I think, will keep the shafts in fork, until down to the intersection of the lodes No. 2 and No. 3, at which point a much larger quantity of water may be expected. Attached also by the same side of the engine, must be a winding apparatus for drawing the stuff from the shaft. I should recommend one similar to that erected by Mr. Sheldon at the Bristol mines, which is both simple and efficient, and not expensive. The process of dressing the ore must be by stamps as the ore is finely disseminated like gold through the stone, and requires to be brought down very low to effect a perfect separation. I should recommend the

floors to be set out much similar to tin floors, but with long drags from the covers and slime pits one below the other. This is necessary, as the waste is very light, having in it so much finely laminated Mica. You can dispense entirely with buddles, racks and frames, by adopting a set of "Bradford's Vanning Machines." This beautiful invention effects a perfect separation of the ore, and renders it marketable in one operation. I should say nearly cent. per cent. is saved in time and labor, besides the advantages of having the ore dressed much cleaner and better than can be done in the old way. To the South side of the engine, to commence with, 12 heads of stamps must be erected; others can be attached as the operations on the mine enlarge. The stuff from the shaft and several shallow levels will be run on tram ways, direct into the passes of the stamps. For the sake of saving labor and facilitating the conversion of timber for the various uses on the mine, a good circular saw mill should be put up in the carpenter's shop. The cost is trifling, compared with its use. If you adopt the new Vanning machines, I must advise you to have "Compound Stamps and Agitators." These stamps have three different speeds. They reduce the stuff to an impalpable powder, and render it fit to go direct to the agitators, from them to the machines, from whence the ore is ready for market.

This mine must be worked in nearly every respect similar to a tin mine. The ores should also be calcined to free them from sulphur and arsenic, which would bring the produce much higher, and a better standard would be thereby obtained.

For your guidance in estimating the value of a lode, the following formula may be relied on. It is estimated rather under what it brings out in practice, as allowance is made for waste.

A cubic fathom of lode=216 cubic feet.

A cubic fathom weighs=32,000 lbs.

A cubic fathom will make at gross=2,000 gallons of work.

10 gallons of work=1 sack.

100 sacks of work weigh=16,000 lbs.

200 sacks of work make=1 cubic fathom.

1 cubic fathom weighs=16 tons (American.)*

The mode of estimating the value then, will be, as so many pounds of clean ore to the 100 sacks of work or lode stuff. I have taken a sampling from the main lode, and the No. 2, or Roberts lode. The produce in marketable ore of the latter, I herewith send you. For this, I will assume a value of thirty pounds, or \$145 per ton.† Samples taken from the stope, the end and the bottom of No. 2, or middle lode, (Roberts lode) give an average throughout, of 2267 lbs. per 100 sacks, which at \$145, is worth \$386 per cubic fathom, or \$128 per fathom of lode as it stands taken at two feet thick. In addition to the above samplings, I took stones from the leader of the main lode, and also some from the addit end, which may be called best work, and gave them to Capt. Pinch, of the Northampton mines, Mass. He made a most careful van of which the four packages I herewith send you, are the results.

Van of sample from Roberts Lode, (No. 2, or Middle Lode.)

Cobalt and Nickel ore,	-	-	-	28.57
Waste,	-	-	-	42.86
Slimes,	-	-	-	28.57
				100.00

Of course the produce of even best work cannot be expected to make, when dressed by machinery or the ordinary process of

*A slight difference is made from the Cornish computation to reduce it to decimal calculation. The English ton is 2240 pounds, the American being 2000 pounds.

C. S. R.

† This is the ore for which Mr. Coffin offers two hundred dollars per ton.

buddling, anything like this sample, nevertheless *there is not the least doubt but that the lodes are very rich and productive*. It does not come within the province of a mine report to say what will be the profits derivable from the working of the mine; that depends entirely on the manner in which the mining operations are conducted, but if due economy and prudence are exercised in the management, I have not the least doubt but the mine will *be highly remunerative*.

CHARLES SAMUEL RICHARDSON,

Mining Engineer.

HISTORY OF THE OLD CHATHAM MINES.

As it may be of interest to the stockholders, to know something about the mining operations carried on in the vicinity of the new mines in ancient times. The following extracts from the "*Centennial Address, by David D. Field, D. D.*," are given relative to this subject.

The reason of the failure of the old enterprises will be easily perceived through a perusal of these extracts. Ignorance of mining operations, want of capital, and particularly the fact that all these explorations *were confined to the same, or nearly the same place*, where a little of the ore occurs, though not in a true vein, are among the most prominent. As regards the operations of Governor Winthrop, it must be remembered that, as Nickel was not known as a metal, until 1751, when it was discovered by Cronstedt, nor Cobalt, until 1733, when it was examined by Brandt, he cannot be supposed to have known the nature or value of the ore for which he carried on mining operations on Great Hill. It is, however, very probable that he was deceived through the great resemblance which Cobalt and Nickel ores bear to silver, and that he therefore, expected to find silver. The following statements are quoted from pages 273—278 of the work above referred to :

Dr. Field writes:

I have already said, that we should have occasion to speak more particularly of Great Hill and its Cobalt Mine. The situation of this hill, the size of which is indicated by its name, is towards the northwest corner of Middle-Haddam Society. That the elder Gov. Winthrop believed that there were mines and minerals in Middletown, and that he had become so convinced of their value as to think seriously of setting up works for improving them, is evident

from the following grant made to him a few years after the first settlement of Middletown.

“The inhabitants of Middletown, for the encouragement of the designs of our much honored governor, Mr. John Winthrop, for the discovery of mines and minerals, and for the setting up of such works as shall be useful for the improvement of them, do hereby grant unto our said much honored governor any profitable mines or minerals he shall find or discover upon any common land within the bounds of our Town, and such woodland as may be convenient for the use of the same to the value of 500 or 1000 acres as it may lie so that it be not nearer than two or three miles from the present dwelling houses of the Town, as the Town shall judge to be least prejudicial to themselves for their necessary fire-wood, provided the Town shall have free liberty of commonage, as far as our town bounds go, until the improvers shall see good to impropriate the same with enclosures—provided further, that the said governor, and such as may be co-improvers with him, will set up the works to improve such mines and minerals as he shall find within these five years and let us know whether he doth accept of this our grant within two years; and so it be to him and his heirs and associates from the time of setting up such works, else at two or five years, and to be in the liberty of the Town to grant the same to any other. May 25, 1661.”

At the time of this grant the people of Middletown dwelt mostly within the limits of the city, and in the lower part of the present village of Cromwell. There is no probability that Mr. Winthrop had any very strong impression of finding valuable mines and minerals, excepting on the hills near the Straits, where lead on the west side of the Connecticut river, and cobalt on the eastern were afterwards more seriously sought, and these localities were sufficiently away from the existing settlements. That his thoughts were mainly, if not entirely turned to Great Hill, is probable from the fact that this hill was long called the “Governor’s Gold Ring,”

a name derived from the impression which people around had, that the governor, from exploration and labor there, had actually found gold, which might at least be made into rings. From the correspondence of the governor with learned men in England, it is possible that some knowledge of this locality crossed the Atlantic in his time.

Be this as it may, no considerable efforts appear to have been made to find gold or any other mineral in this hill for about a century after this grant was made. But about 1762 Dr. John Sebastian Stephauney, a German, employed a number of men, and made a horizontal opening into the hill in search of hid treasures. He continued his exertions but a short time.—About 1770 he renewed them in connection with two other Germans John Knool and Gominus Erkelens; but at length it appears that he made over the management of the concern to his associates, reserving to himself only a portion of the profits, and there was an agreement that what metals and minerals were sent to Great Britain should be consigned to Knool's friends, and those sent to Holland to Erkelens'. A large opening was made in the hill, and the superincumbent matter was prevented by stanchions from falling upon the laborers. Many casks of ore were obtained and sent to Europe, and it is probable some were sent to China. But as all the persons, laborers as well as principals, were foreigners, and the ore was exported, little was known of its character or value. Various conjectures were made as to what it contained; the better informed, however, believed that Cobalt was the object sought. Erkelens seems finally to have been the principal manager. This appears from a passage in the diary of Pres. Stiles of Yale College. The president writes:

“1787, Jan. 1. Mr. Erkelens visited me, full of his Cobalt mine, and China voyage. He some years ago bought the Governor's Ring, as it is called, or a mountain in the N. W. corner of East Haddam, [Middle Haddam] comprehending about 800 acres or about a square mile area. Here he finds plenty of Cobalt, which

he manufactures into smalt, with which is made the beautiful blue on China ware, &c.”

“Gov. Trumbull has often told me that this was the place to which Gov. Winthrop of New London used to resort with his servant, and after spending three weeks in the woods of this mountain in roasting ores and assaying metals and casting gold rings he used to return home to New London with a plenty of gold. Hence this is called the Gov. Winthrop’s ring to this day. Gov. Winthrop was an adept, in intimate correspondence with Sir Kenelm Digby, and the first chemical and philosophical characters of the last century—as may be seen in the dedication of 40th vol. Phil. Transactions 1740.”

“Mr. Erkelens about 1775 being a projector, erected a distillery in Haddam [Middle Haddam] 6 miles from Middletown, on a stream descending from this mountain—he also purchased the Cobalt mine there. He has been to £2,000 sterling expense to no profit. He is going on a voyage to China, carrying with him 20 tons of Cobalt ore.”

So far the diary of President Stiles. Dr. Field continues :

Whether he actually carried his Cobalt ore to China in 1787 we are not informed. But from the time he left, operations at the mine were suspended, and nothing more was done there for about 30 years. The opening in the hill remained a considerable period but at length the stanchions giving way, the mass above fell and filled it.

When Pres. Stiles visited the hill in 1787, he sketched the Governor’s Gold Ring, and a map showing the country from New London to Middle Haddam and Middletown. This he was doubtless prompted to do, by the prospect which Great Hill afforded, which strictly considered is a hill of no inconsiderable size and elevation, resting on the range of the Strait Hills. The Cobalt mine is near the bottom of this hill running so far as discovered a short distance from it, taking a semicircular course in accordance with its form, begin-

ning at the west southwest and gradually bending around towards the south and south-east, being at an elevation on the range of hills of about 400 feet above the level of the Connecticut, the top of the hill rising two or three hundred feet more. From the summit the view was fine in all directions then, except the north-east where a range of hills stretches far into the interior. It is finer now, as the lands are more generally cleared and the country more densely settled. Besides the windings of the river directly under the eye you often see vessels moving upon it propelled by wind and steam, and on the numerous hills and ranges of hills on either side, many churches and habitations of men. In a clear day, Long Island Sound with its moving navigation, and Long Island shore are distinctly visible. Not far from you, you contemplate the birth-place of David Brainerd, and very near you the birth-place of James Brainerd Taylor, while in the line towards N. London you have the birth-place of Dr. Emmons, and further on, that of Dr. Griffin; and in the entire view the birth-places or residences, of many other men; distinguished in their day, some in civil and some in military life. This prospect alone is worth a visit to Great Hill, and if persons wish to ramble, a mile and a half east of this hill is Clark's Hill, from which the Sound can be seen.

But as to the mine, Mr. Seth Hunt, from New Hampshire, commenced operations at Great Hill in the autumn of 1818 and continued them about two years. Anticipating great results, he expended liberally and exhausted his own resources. In these circumstances he sold interests in what he had done and obtained, say one sixteenth to one friend and one eighth to another, until he had gathered around him six associates only one of whom is now living.— This survivor states that Mr. Hunt expended about \$20,000; that his main outlay in mining was in following the vein opened by the Germans downwards, but that he also opened the earth and traced near a quarter of a mile eastward, where he found more mica and the absence of hornblend, and that he expended much in repairing

the old glass furnace in Glastenbury and in fitting it to smelt, in carrying ore thither (where most was sent,) STAMPING IT BY HAND!! and reducing by potash. This survivor further states, that though Mr. Hunt read books on mining, he did not well understand his work, and he doubts whether the man on whom he relied for chemical and scientific information, knew more than he did himself; that he obtained as he supposed 1000 lbs. of Cobalt which was proved in England to be nickel, containing from three to four parts of Cobalt. This proof induced an entire suspension of operations.

In the summer of 1844 the mine was opened again by Prof. Shepherd author of the "Report on the Geological Survey of Connecticut." He employed only a few hands for a short time, but what disposition he made of the ore, and what discoveries he or others obtained from it have not been ascertained, and it is a remarkable fact, after all that has been done at different periods in and about Great Hill by the first Gov. Winthrop, by the Germans, Mr. Hunt, and Prof. Shepherd, so little is really known to the public as yet as to the worth of the minerals, and whether the mine can be so wrought as to render much profit to the undertakers. It is evident however, that the great object which has been sought is Cobalt, which has long been the name of the supposed mine.
